(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 444 908 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
20.02.2019 Bulletin 2019/08

(21) Application number: **17781977.8**

(22) Date of filing: **10.04.2017**

(51) Int Cl.:
H01R 25/14 *(2006.01)*

(86) International application number:
PCT/ES2017/070221

(87) International publication number:
WO 2017/178680 (19.10.2017 Gazette 2017/42)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **12.04.2016 ES 201630453**

(71) Applicant: **Fabricacion De Material Electrico S.A.**
08110 Montcada I Reixac (Barcelona) (ES)

(72) Inventor: **LATRE NAVARRO, Carlos Jose**
08110 Montcada I Reixac (Barcelona) (ES)

(74) Representative: **Durán-Corretjer, S.L.P.**
Còrsega, 329
(Paseo de Gracia/Diagonal)
08037 Barcelona (ES)

(54) MODULE FOR A SLIDABLE ELECTRICAL OUTLET

(57) The invention relates to a module for a slidable electrical outlet, which comprises: an electrical outlet part; a guide system along which the electrical outlet part can slide, the guide system comprising terminals for establishing the electrical connection with the electrical outlet part at points on the path of the electrical outlet part along the guide system; and an element for attaching the module for a sliding electrical outlet to a surface. According to the invention, the guide system comprises at least one guide, and the electrical outlet part comprises at least one recess, the guide being disposed in the recesses.

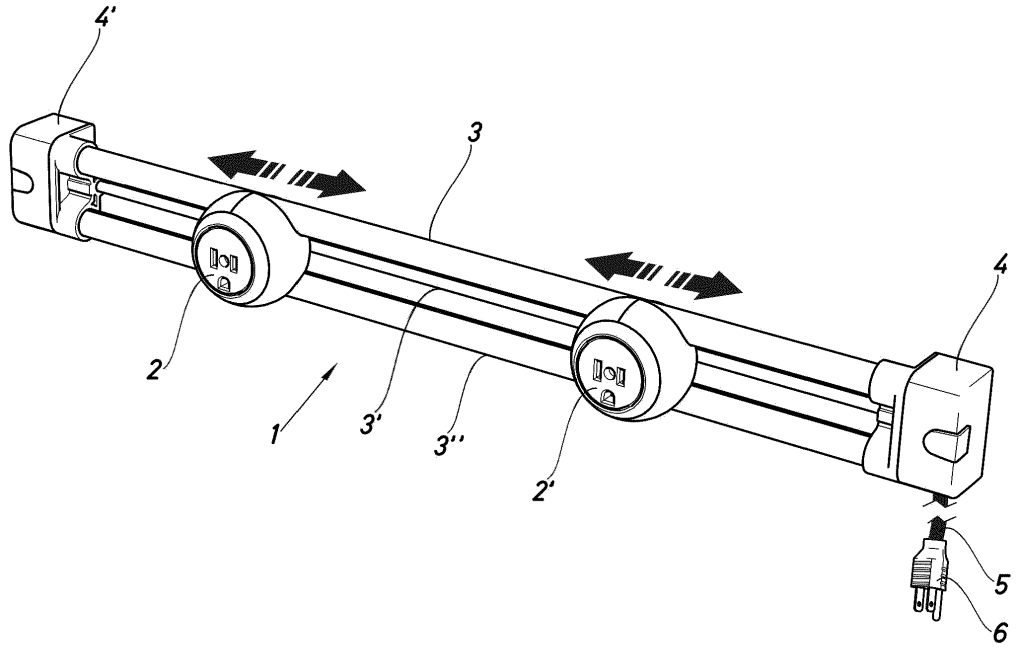

Fig.1

EP 3 444 908 A1

Description

[0001] The present invention relates to a module for a slidable electrical outlet, that is to say a module that comprises an electrical outlet of which the position can vary by being slid along the module.

[0002] Modules of this type currently on the market comprise a power strip that acts as a guide for the electrical outlet and as a case for the electrical conduction elements, which are referred to as electrical cable terminals in the present application. Said elements are conductive elements that establish the electrical connection to the electrical distribution cables. The power strip contains, in the interior thereof, electrically conductive elements which are arranged along the power strip. Said conductive elements or terminals correspond to phase, neutral and ground in the case of single-phase alternating current. The power strip has one or more grooves which receive a projection from the electrical outlet. The electrical outlet has electrical connectors in the form of legs or brushes which make contact with the conductive elements in the interior of the power strip.

[0003] British patent GB926769 discloses a module of this type comprising a single front groove into which an intermediate part between the electrical outlet and the power strip conductors is inserted. Furthermore, the electrical outlet is required to be situated vertically, not horizontally as is normally the case.

[0004] British patent GB2067363 discloses a module similar to that mentioned above, in which the central groove is covered by a covering plastics piece. This improves the module safety. However, it is not possible to make the electrical outlet slide once the covering piece is placed.

[0005] US patent US7094077 discloses a module in which the piece that comprises the connectors to which the electrical outlet is slidably connected is open, the electrical outlet having an intermediate piece comprising projections which are inserted into the recesses in the base piece in which the terminals are situated. The intermediate piece is complex and requires a blocking mechanism in order to function. The blocking mechanism disconnects the electrical outlet to allow it to slide.

[0006] All of the documents cited above are problematic in that the base piece comprising the conductors is very large. Furthermore, installing said piece in walls requires another, intermediate securing piece to be used or the power strip to be disassembled. Consequently, this type of module is very large and for this reason unsuitable for use in a domestic setting. Furthermore, the existence of front grooves in the power strip which are therefore visible and easily accessible presents an obvious safety issue, particularly if there is more than one.

[0007] In order to solve said problem, the present invention discloses a module for a slidable electrical outlet, which comprises:

- an electrical outlet piece,
- a guide system along which the electrical outlet piece can slide, said guide system having terminals for establishing the electrical connection to the electrical outlet piece at points of the path of the electrical outlet piece along the guide system, and
- an element for securing the module for a slidable electrical outlet to a surface,

in which the guide system comprises at least one guide and the electrical outlet piece comprises at least one recess, the guide being arranged in the recess.

[0008] The present invention provides a solution to the problem addressed by means of using different pieces for each of the active conductors and for the neutral, that is to say the electrical cable terminals. Said guide pieces are received in recesses in the piece that constitutes the electrical outlet. Consequently, it is not necessary to use an intermediate connection piece between the piece that constitutes the electrical outlet and a power strip. Furthermore, upon being made separately, the conductors can be protected using less space. The invention also allows visible front grooves to be dispensed with, if desired.

[0009] Advantageously, the guide system comprises three separate guides and the electrical outlet piece comprises three recesses, each guide being arranged in the corresponding recess of said piece.

[0010] Preferably, each of the guides comprises an electrical cable terminal.

[0011] Advantageously, the guides that comprise the phase and neutral terminals of an electrical cable have an interior space in which said terminals are located.

[0012] More preferably, each of the recesses in the electrical outlet comprises a contact piece that comes into contact with an electrical cable terminal.

[0013] Preferably, at least one of the separate guides comprises grooves for access to the interior space thereof.

[0014] Even more preferably, said groove is arranged vertically. Thus, when the device is connected to the surface, the groove is not visible and there is no danger of attempting to insert objects into the groove.

[0015] Preferably, the contact pieces that come into contact with the phase and neutral terminals are inserted into the grooves in the guides for said phase and neutral terminals.

[0016] Optionally, the contact pieces are electrically connected to the pins of a connector that is inserted into the electrical outlet.

[0017] In one possible embodiment, the ground terminal is a metal piece that constitutes one of the guides.

[0018] In preferred embodiments, at least the recess in the electrical outlet in which the ground terminal is arranged is an orifice. In further preferred embodiments, two of the recesses in the electrical outlet are grooves.

[0019] To aid understanding, explanatory yet non-limiting drawings are appended by way of example which show an embodiment of the present invention.

Fig. 1 is a perspective view of an embodiment of a module for a slidable electrical outlet according to the present invention.

Fig. 2 is a perspective view of an exploded detail of the end of the module for a slidable electrical outlet from Fig. 1.

Fig. 3 is an exploded perspective view of the electrical connectors, and the housings thereof, of the electrical outlet of the module from Fig. 1.

Fig. 4 is an exploded perspective view of an electrical outlet of the module for a slidable electrical outlet from Fig. 1.

Fig. 5 is a perspective view of the top part of an electrical outlet of the module for a slidable electrical outlet from Fig. 1.

Fig. 6 is a perspective view of the bottom part of an electrical outlet of the module for a slidable electrical outlet from Fig. 1.

Fig. 7 is a perspective view of an exploded detail of the connection between the electrical outlet and the module for a slidable electrical outlet from Fig. 1.

Fig. 8 is a perspective view of an exploded detail of the connection of an end with an electrical connection of the module for a slidable electrical outlet from Fig. 1.

Fig. 9 is a perspective view of an exploded detail of the connection of an end without an electrical connection of the module for a slidable electrical outlet from Fig. 1.

Fig. 10 is a perspective view of an exploded detail of the securing of the module for a slidable electrical outlet from Fig. 1 to a surface.

[0020] Fig. 1 shows an embodiment of the module for a slidable electrical outlet -1- according to the present invention which comprises two slidable electrical outlets -2-, -2'- which can be moved along two lateral guides -3-, -3"- and a central guide -3'- in the directions indicated by the arrows (see Fig. 1).

[0021] The module for a slidable electrical outlet -1- comprises two securing elements -4-, -4'- (see Fig. 1), arranged at the ends of the guides -3-, -3'-, -3"-, which allow the module for a slidable electrical outlet -1-to be secured to a surface, for example a wall. In turn, the securing elements -4'-, -4- act as stops for the movement of the slidable electrical outlets -2-, -2'- and prevent said outlets from being removed by means of an end piece -41- over which a cover -42- is placed which comprises a protector -42'- (see Fig. 2) intended for protecting a screw -8- (see Fig. 10).

[0022] As shown in Fig. 3, a slidable electrical outlet -2- according to the present invention comprises, in the interior thereof, a phase contact piece -21-, a neutral contact piece -23- and a ground contact piece -22-. The phase -21-, neutral -23- and ground -22- contact pieces are intended for transmitting electricity to a connector of a plug that is connected to the electrical outlet -2-.

[0023] Fig. 4 shows how the phase -21- and neutral -23- contact pieces have, at one end, curved portions -21'-, -23'- intended for electrical contact with conductive elements arranged in the guides and, at the other end, tabs -21"-, -23"- which come into contact with the pins of a connector when connected to the slidable electrical outlet -2-. Said pieces -21-, -23- are arranged inside a housing -24- which comprises an orifice -24'- for the insertion of a screw -7- (see Fig. 3).

[0024] The ground contact piece -22- (see Fig. 3) comprises two arms -25-, -25'- and an orifice -22'- and is situated between two auxiliary pieces -26- and -27- which also comprise orifices -26'-, -27'-. The arms -25-, -25'- are intended to accommodate the central guide -3'- therebetween.

[0025] As shown in Fig. 3, the slidable electrical outlet -2- comprises two halves -28-, -28'- and a cover -29- which comprises an orifice -29'-. Orifices -20-, -20'-, -20"- are also located in the cover -29- for the insertion of pins of a plug. The pins inserted into the orifices -20'-, -20"- come into contact with the tabs -23", -21"- of the phase -21- and neutral -23- contact pieces for the transmission of electricity.

[0026] The cover -29- is secured to the housing -24- of the phase -21- and neutral -23- contact pieces together with the auxiliary pieces -26-, -27- of the ground contact piece -22- and with the ground contact piece -22- itself by means of a screw -7- that passes through the orifices -29'-, -24'-, -26'-, -22'-, -27'- of each of the secured elements.

[0027] As shown in Fig. 5 and 6, when the two halves -28-, -28'- and the cover -29- of a slidable electrical outlet -2- are joined, the curved portions -21'-, -23'- of the phase -21- and neutral -23- contact pieces protrude at the bottom and top of the electrical outlet -2-, respectively. The curved portions -21'-, -23'- are arranged in recesses -200-, -200'- into which the lateral guides -3-, -3"- of the module for a slidable electrical outlet -1- slot (see Fig. 2).

[0028] In order to place a slidable electrical outlet -2- onto the guides -3-, -3'-, -3"- of the module for a slidable electrical outlet -1-, the electrical outlet -2- is moved towards the guides -3-, -3'-, -3"- as shown in Fig. 7. The lateral guides -3-, -3"- slot into the recesses -200-, -200'- in the electrical outlet and the guide -3'- is inserted into an orifice -201- (see also Fig. 3) which passes through the two halves -28-, -28'- of the electrical outlet -2-. Upon placing the slidable electrical outlet -2- on the guides -3-, -3'-, -3"-, the phase -21- and neutral -23- contact pieces are inserted into grooves -35-, -36- arranged in the lateral guides -3-, -3"- opposite one another. In this way, the

curved portions -21'-, -23'- of said phase -21- and neutral -23-contact pieces come into contact with flat rods -31-, -32-. On the other side, the ground -22- contact piece comes into contact with the guide -3'- in the interior of the electrical outlet -2- (not shown).

[0029] As shown in Fig. 7 and 8, the physical connection between the end piece -41- and the guides -3-, -3'-, -3"- is established by means of three housings -46-, -46', -46"-, one per guide, arranged in the end piece -41-. Upon connecting the end piece -41- to the guides -3-, -3'-, -3"-, said guides are inserted in the housings -46-, -46'-, -46"-. The guides -3-, -3'-, -3"- are secured to the end piece -41- by means of three screws -47-, -47'-, -47"-.

[0030] The module for a slidable electrical outlet -1- is connected to the mains through one of the securing elements which is indicated by the reference sign 4 in the example shown in the figures. The electricity enters the securing element -4- by means of an electrical cable -5- and the corresponding connector -6-thereof, as shown in Fig. 1. The electrical cable -5- comprises three terminals: phase -51-, neutral -53- and ground connection -52-, and is inserted into the securing element -4- through an orifice -49 (see Fig. 8 and 9). In order to secure the module for a slidable electrical outlet -1- to a surface, the cover -42-comprises a hole -48- (see Fig. 8 and 9) into which a screw -8- (see Fig. 10) is inserted.

[0031] In order to power the slidable electrical outlet -1-, the phase -51- and neutral -53- terminals of the electrical cable -5- have to come into contact with the flat rods -31-, -32- arranged in the interior of the lateral guides -3-, -3"- and the ground connection terminal -52- of the electrical cable -5- has to come into contact with the central guide -3'- (see Fig. 7). For this purpose, the present invention has lateral conductive pieces -43-, -44- and a central conductive piece -45-.

[0032] The flat rods -31-, -32- (see Fig. 8) are connected by means of the lateral conductive pieces -43-, -44-, each of which comprises a connection tab -43'-, -44'- and a hole -43"-, -44"-. The phase -51- and neutral -53- terminals are inserted on the screws -47-, -47'- that pass through the holes -43"-, -44"- and are inserted into holes -33-, -34- arranged in the lateral guides -3-, -3"-. In this way, the lateral conductive pieces -43-, -44- are secured to the end piece -41- and are in contact with the phase -51- and neutral -53- terminals of the electrical cable -5-. The lateral conductive pieces -43-, -44- in turn are in contact with the flat rods by means of the connection tabs -43'-, -44'- (see Fig. 7).

[0033] The central guide -3'- is connected by means of the central conductive piece -45- for the central guide -3'- which piece fits into the central guide -3'- and comprises an orifice -45'- which is threaded for receiving a screw -47"-. In this way, the central guide -3'- is in contact with the central conductive piece -45- which, in turn, is in contact with the screw -47"- onto which the ground connection terminal -52- is inserted.

[0034] The other securing element -4'- (see Fig. 9) of the module for a slidable electrical outlet -1- does not have any electrical function. As shown in Fig. 9, the structure of said element is exactly the same as that of the securing element -4- and the connection to the guides is identical, the only difference being that it does not contain electrical cables.

[0035] Although the invention has been set out and described with reference to embodiments thereof, it should be understood that these do not limit the invention, and that it is possible to alter many structural or other details that may prove obvious to persons skilled in the art after interpreting the subject matter disclosed in the present description, claims and drawings. Therefore, the scope of the present invention includes any variant or equivalent that could be considered covered by the broadest scope of the following claims.

Claims

1. Module for a slidable electrical outlet, comprising:

   - an electrical outlet piece,
   - a guide system along which the electrical outlet piece can slide, said guide system having terminals for establishing the electrical connection to the electrical outlet piece at points of the path of the electrical outlet piece along the guide system, and
   - an element for securing the module for a slidable electrical outlet to a surface,

   characterised in that the guide system comprises at least one guide and the electrical outlet piece comprises at least one recess, the guide being arranged in the recess.

2. Module according to claim 1, **characterised in that** the guide system comprises three separate guides and the electrical outlet piece comprises three recesses, each guide being arranged in the corresponding recess of said piece.

3. Module according to claim 2, **characterised in that** each of the guides comprises an electrical cable terminal.

4. Module according to claim 3, **characterised in that** the guides that comprise the phase and neutral terminals of an electrical cable have an interior space in which said terminals are located.

5. Module according to either claim 3 or claim 4, **characterised in that** each of the recesses in the electrical outlet comprises a contact piece that comes into contact with said electrical cable terminal.

6. Module according to claim 4, **characterised in that** at least one of the guides comprises grooves for ac-

cess to the inner space thereof.

7. Module according to claim 6, **characterised in that** said groove is arranged vertically.

8. Module according to claim 5 and either claim 6 or claim 7, **characterised in that** the contact pieces that come into contact with the phase and neutral terminals are inserted into the grooves in the guides for said phase and neutral terminals.

9. Module according to claim 8, **characterised in that** the contact pieces are electrically connected to the pins of a connector that is inserted into the electrical outlet.

10. Module according to any one of claims 2 to 9, **characterised in that** the ground terminal is a metal piece that constitutes one of the guides.

11. Module according to any one of claims 2 to 10, **characterised in that** at least the recess in the electrical outlet in which the ground terminal is arranged is an orifice.

12. Module according to any one of claims 2 to 11, **characterised in that** two of the recesses in the electrical outlet are grooves.

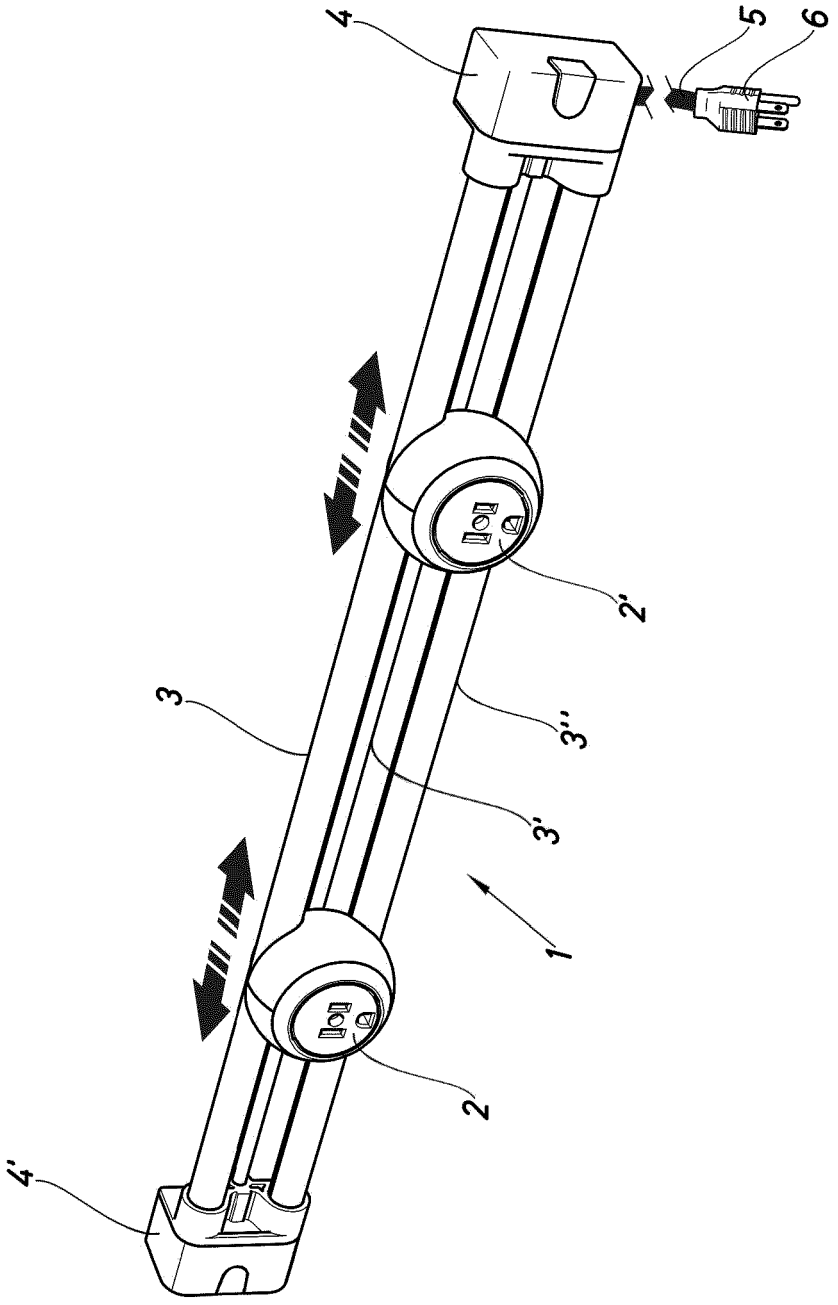

Fig.1

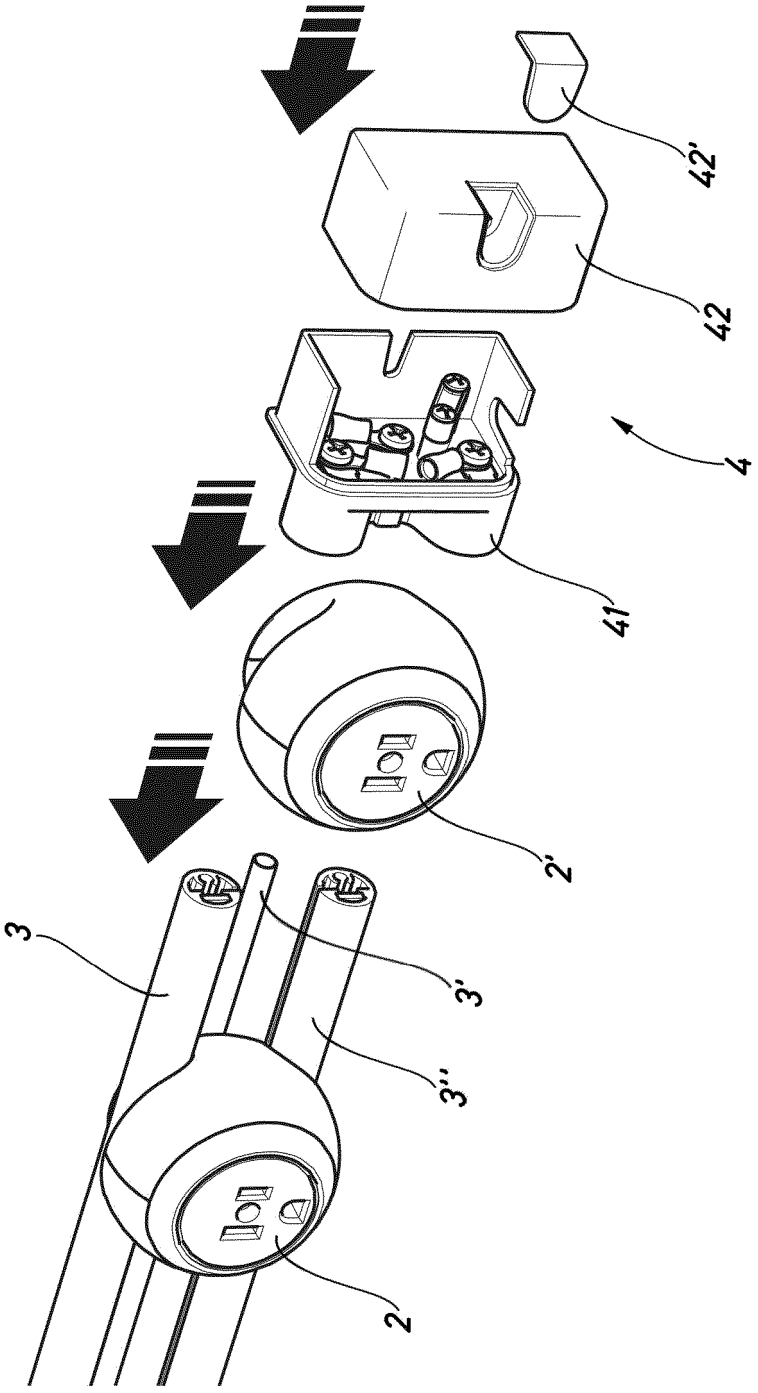

Fig.2

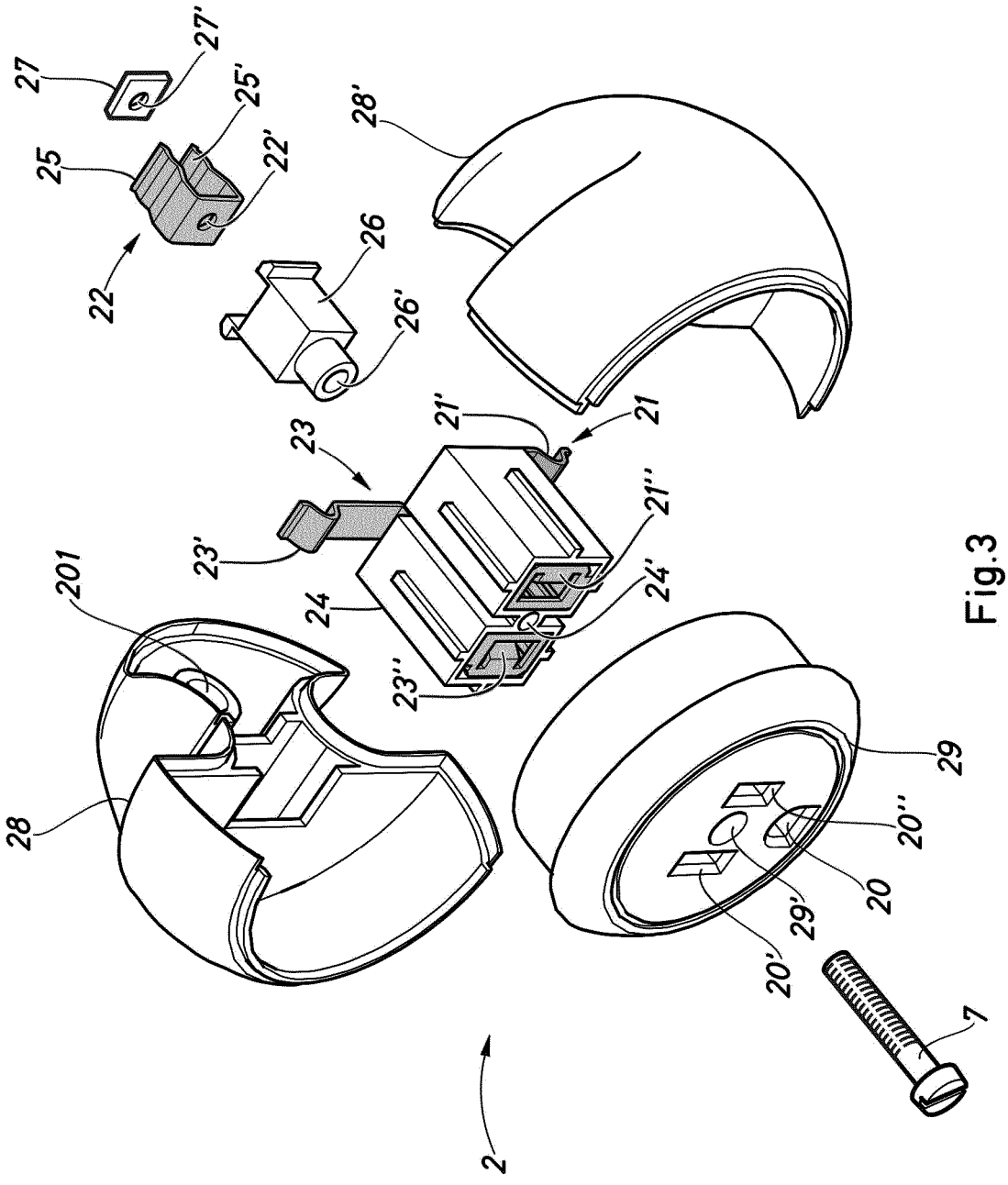
27
27''
25'
25
22'
22
26
26'
28'
21'
21
23
23'
21''
24'
24
201
23''
28
29
20''
20
29'
20'
7
2

Fig.3

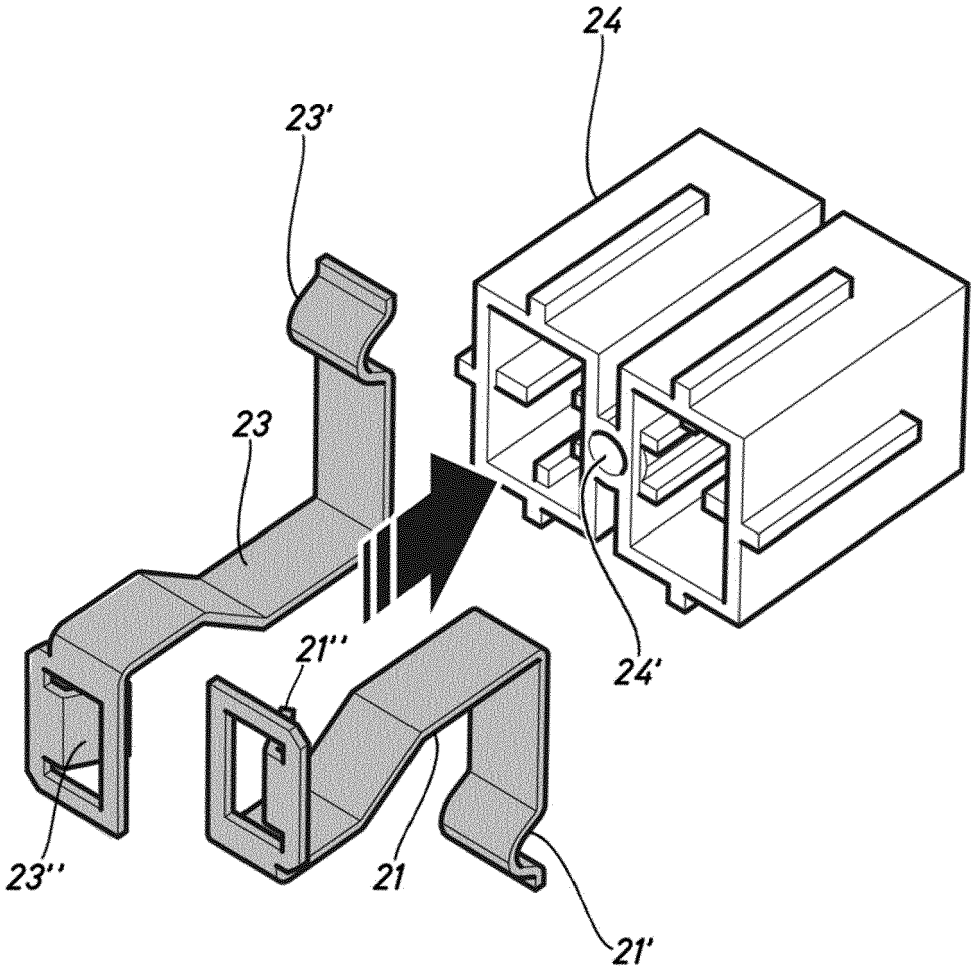

Fig.4

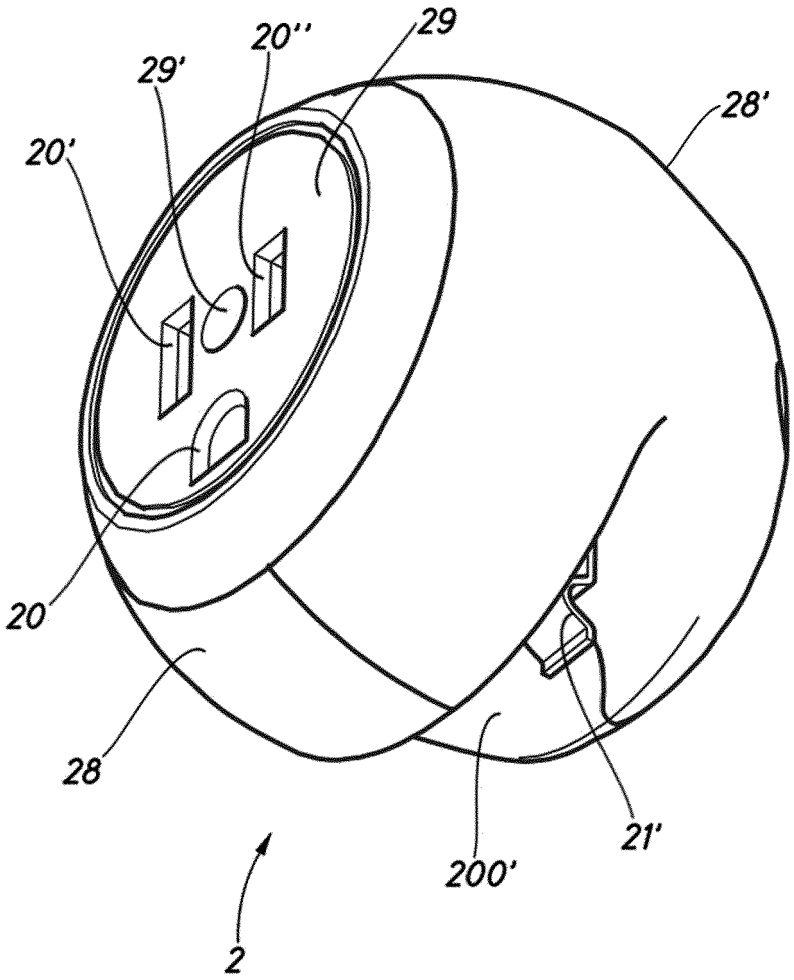

Fig.5

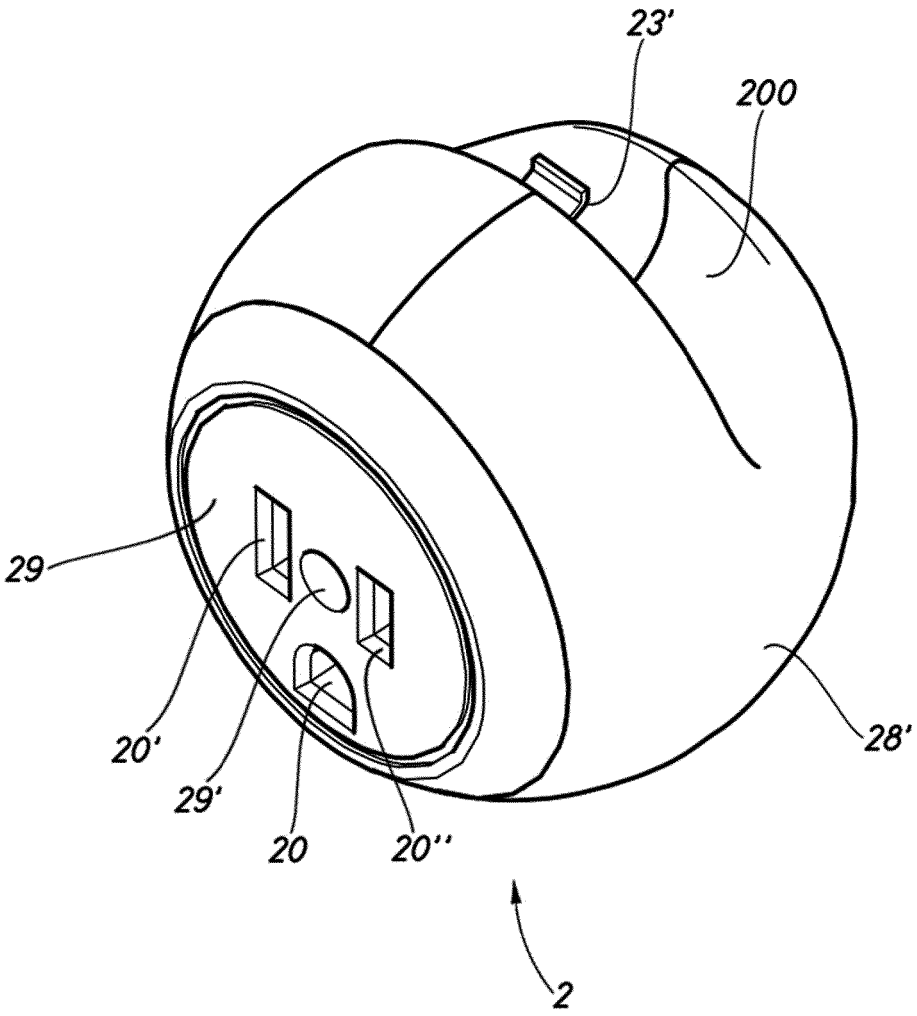

Fig.6

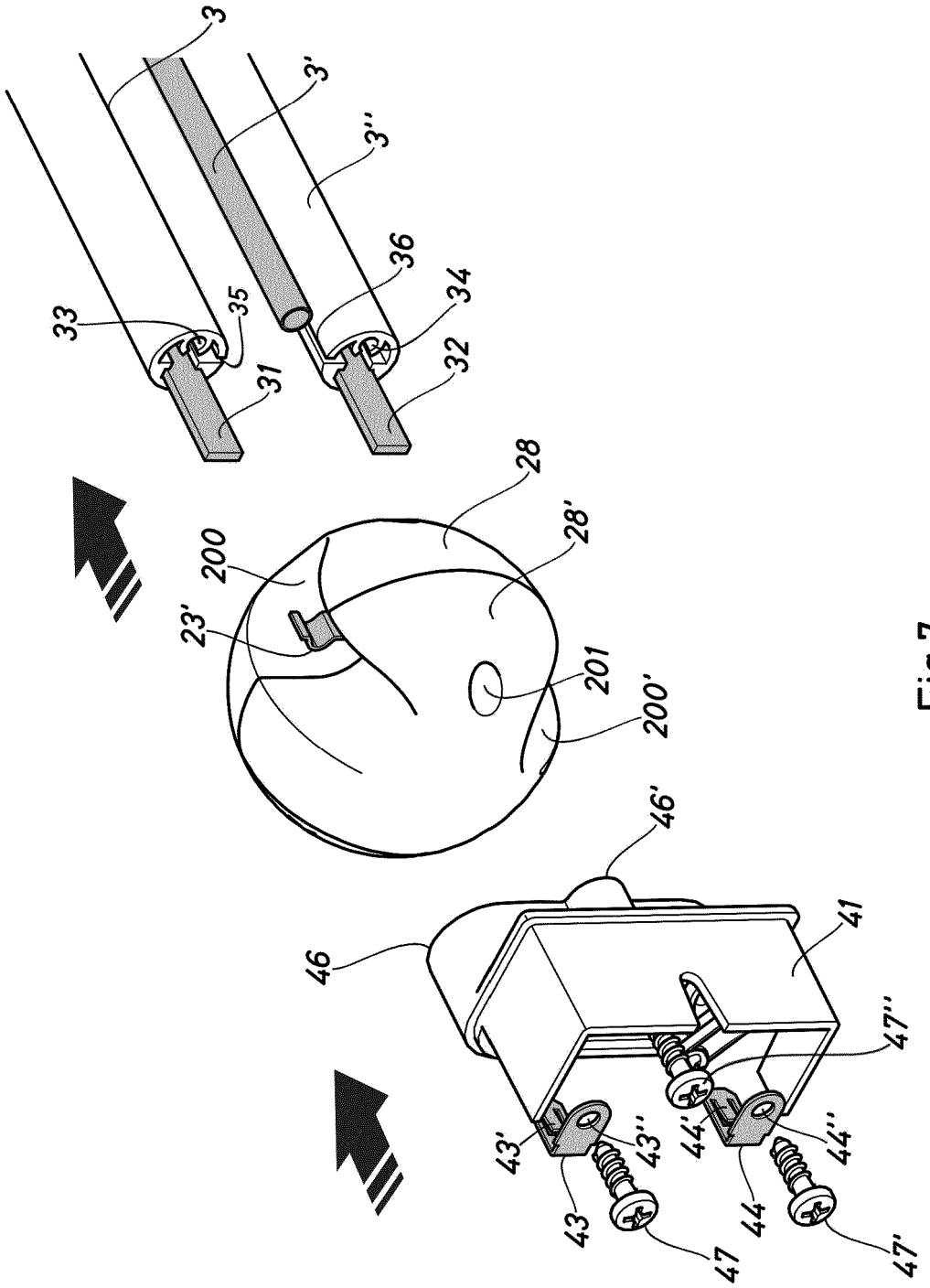
3
3'
3''
36
34
33
35
32
31
28
28'
200
23'
201
200'
46'
46
41
47''
43'
43''
44'
44''
43
44
47
47'

Fig.7

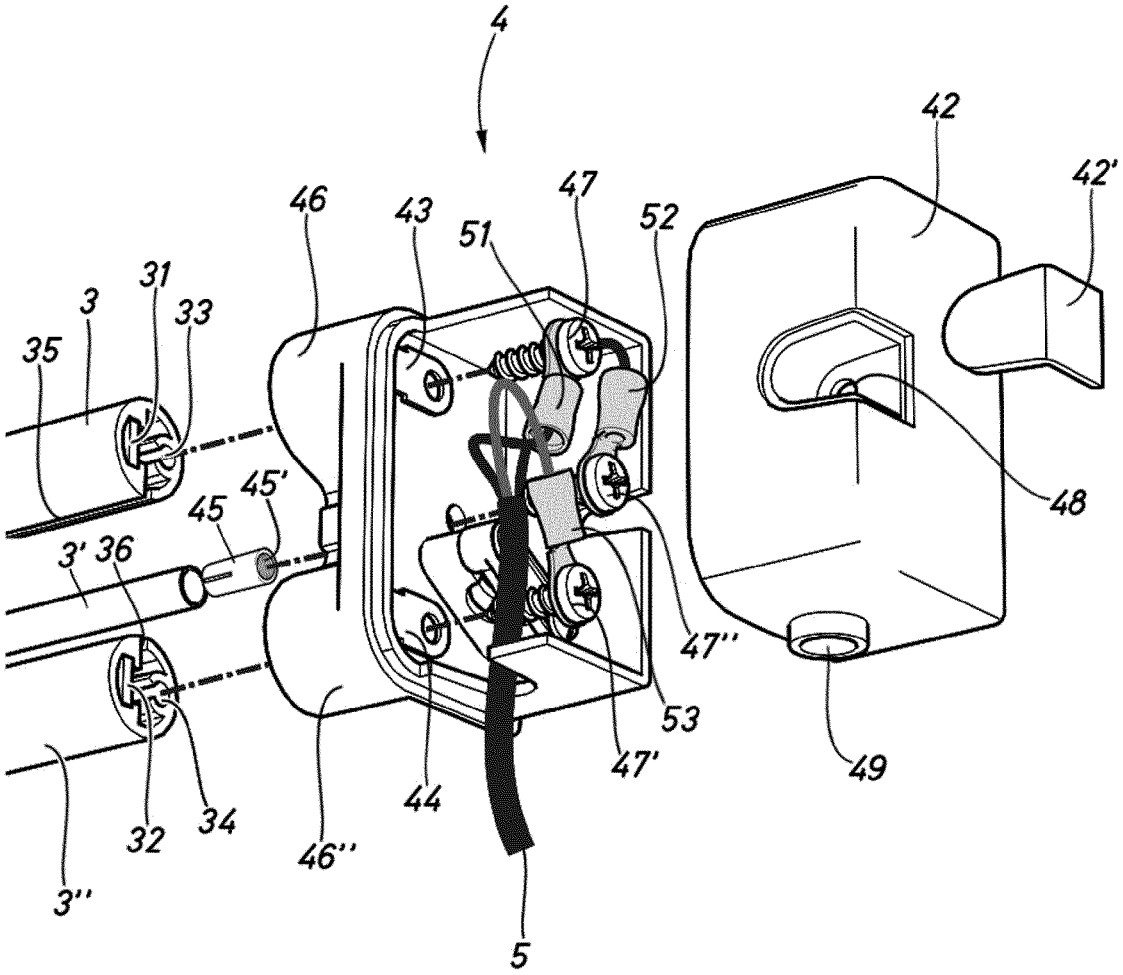

Fig.8

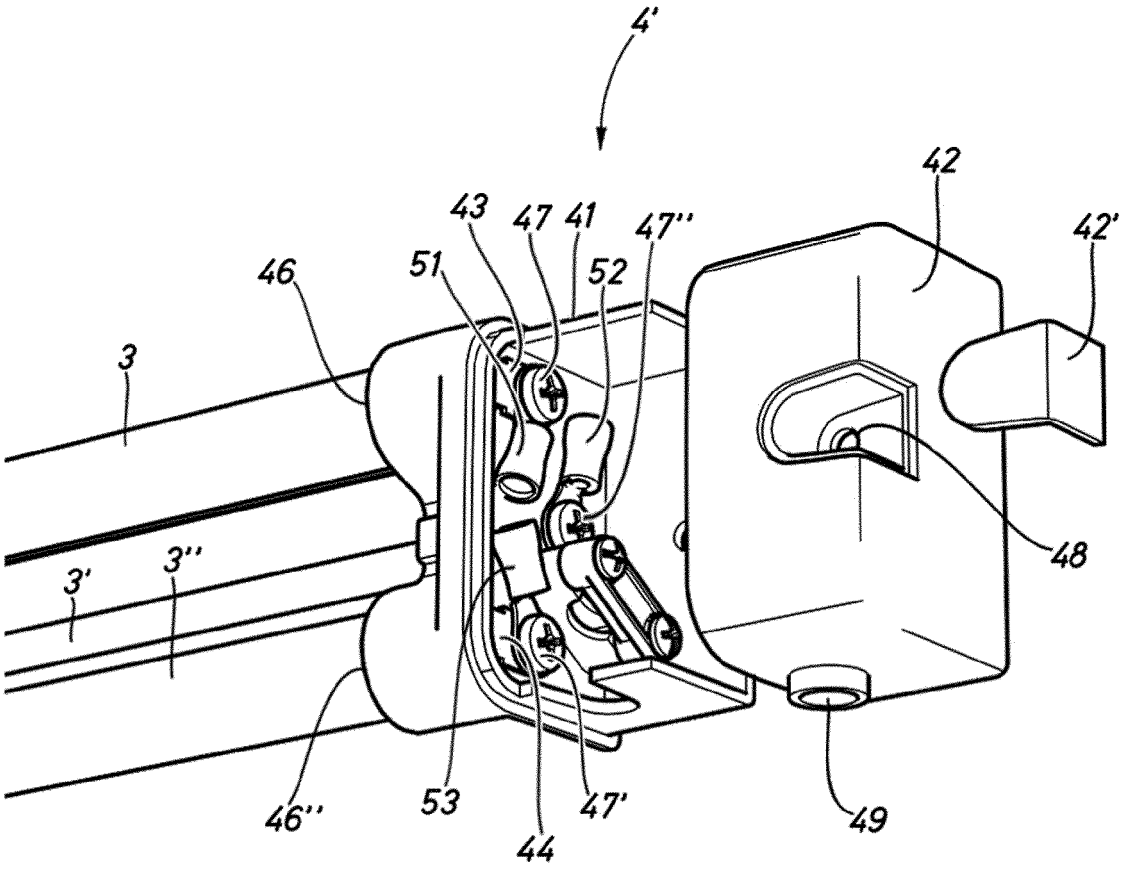

Fig.9

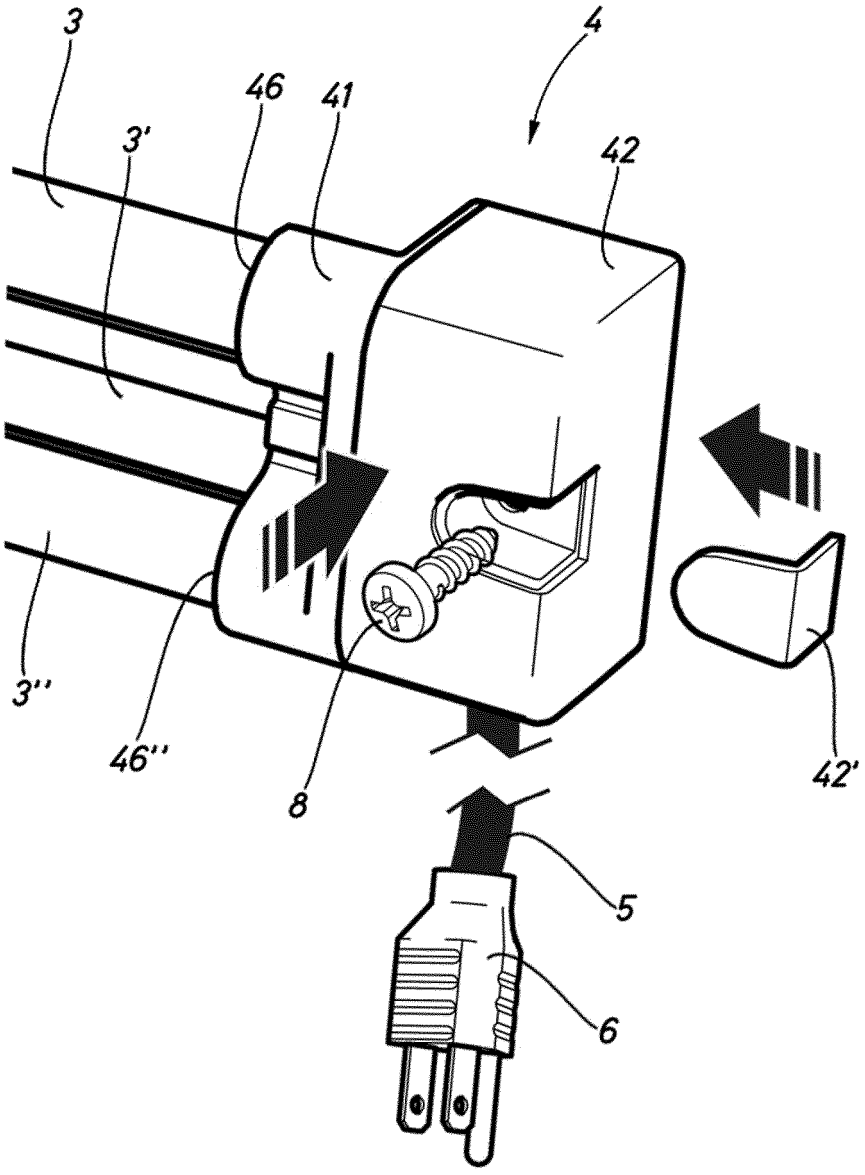

Fig.10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2017/070221

A. CLASSIFICATION OF SUBJECT MATTER

H01R25/14 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 2535694 B1 (SISTEMAS METALPER, S.L.) 13/05/2015, page 8, line 19 - page 13, line 21; figures 1 - 6.	1-12
A	US 7094077 B1 (CHEN) 22/08/2006, column 2, line 4 - column 4, line 27; figures 1 -9.	1-12
A	GB 2067363 A (MATSUSHITA ELECTRIC WORKS, LTD.) 22/07/1981, page 1, line 99 - page 3, line 15; figures 1 - 7.	1-12
A	ES 1068230U U (ANGEL PERALES FAYOS) 16/09/2008, column 6, line 53 - column 8, line 32; figures 1 - 2.	1-12

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance.
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure use, exhibition, or other means.
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents , such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16/05/2017	**(17/05/2017)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer R. San Vicente Domingo Telephone No. 91 3498525

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2017/070221

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6350135 B1 (ACKLIN ET AL.) 29/02/2002, column 3, lines 1 - 54; figures 1 - 12.	1-12

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2017/070221

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
ES2535694 A1	13.05.2015	WO2014041230 A1	20.03.2014
		EP2897236 A1	22.07.2015
		EP2897236 A4	26.08.2015
		ES1077942U U	30.10.2012
		ES1077942Y Y	29.01.2013
US7094077 B1	22.08.2006	NONE	
GB2067363 A	22.07.1981	JPS5696475 A	04.08.1981
		JPS56129459U U	01.10.1981
		JPS6219781Y Y2	20.05.1987
		JPS5710 A	05.01.1982
		JPS5756284B B2	29.11.1982
		IT1129494 B	04.06.1986
		DE3048828 A1	01.10.1981
ES1068230U U	16.09.2008	ES2545968T T3	17.09.2015
		RU2010154509 A	20.07.2012
		RU2516305 C2	20.05.2014
		MA32443 B1	03.07.2011
		JP2011522382 A	28.07.2011
		JP5309214B B2	09.10.2013
		CN102057542 A	11.05.2011
		CN102057542B B	23.04.2014
		MX2010012916 A	14.12.2010
		US2011070754 A1	24.03.2011
		US8469726 B2	25.06.2013
		CA2724613 A1	10.12.2009
		CA2724613 C	19.04.2016
		AU2009254507 A1	10.12.2009
		WO2009147256 A1	10.12.2009
		EP2290763 A1	02.03.2011
		EP2290763 A4	09.01.2013
		ES1068230Y Y	16.12.2008
US6350135 B1	26.02.2002	GB2352885 A	07.02.2001
		GB2352885 B	26.03.2003
		FR2797107 A1	02.02.2001
		FR2797107 B1	02.04.2004
		DE10036727 A1	12.04.2001
		DE10036727 B4	16.06.2005

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- GB 926769 A **[0003]**
- GB 2067363 A **[0004]**
- US 7094077 B **[0005]**